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Dynamic capabilities: a systematic literature review of theory and practice

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Purpose. Although the dynamic capability concept has been one of the most researched topics in strategic management in recent years, it is not commonly defined in theory and hardly applied in practice. For this reason, the authors decided to re-evaluate dynamic capability literature.

Design/Method/Approach. Systematic literature review.

Findings. Various discrepancies concerning the very nature of dynamic capabilities and their impact on firm performance are identified that need to be resolved.

Theoretical implications. For the purpose of enabling more precise prediction, it is recommended to contrast various dynamic capability concepts, reducing the number and increasing the predictability of the contingencies involved. It is advised to develop these scenarios based on the various seminal papers on dynamic capabilities, grounded in empirical research and supported by specific examples.

Practical implication. It is concluded that there is a generalized version of the dynamic capability concept that allows one to understand the rough outline of dynamic capability theory. However, it is noted that this generalized, contingency-based version compromises the prediction of specific dynamic capability deployment outcomes, therefore hindering dynamic capabilities in gaining practical application.

Originality/Value. Complementary and opposing views on the characteristics, causalities and contingencies of the dynamic capability construct are combined and contrasted respectively.

Research limitations/Future research. The paper highlights avenues for further research by contrasting, rather than merging, different perspectives.

Paper type – conceptual.

Keywords: dynamic capabilities; theory; systematic literature review.

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Динамічні здібності: систематичний аналіз літератури з теорії і практики

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Мета дослідження. Не дивлячись на те, що концепція динамічних здібностей – одна з найбільш досліджуваних тем в області стратегічного менеджменту, не існує єдиного розуміння її теорії. Концепцію також важко застосовувати практично. Тому автори вирішили провести аналіз існуючої літератури з динамічних здібностей.

Метод дослідження – систематичний аналіз літератури.

Результати. Було виявлено низку необхідних до вирішення розбіжностей щодо природи динамічних здібностей і їх впливу на успішність фірми.

Теоретична значимість дослідження. З метою більш точних прогнозів рекомендовано застосовувати різні концепції динамічних здібностей. При цьому необхідно зменшати кількість випадкових обставин і прагнути до збільшення їх вчасного визначення. Рекомендовано опрацьовувати різні сценарії, які повинні бути засновані на наукових дослідженнях з динамічних здібностей, особливо тих, що базуються на емпіричних дослідженнях і підкріплені практичними прикладами.

Практична значимість дослідження. Зроблено висновок, що існує узагальнена версія концепції динамічних здібностей, яка необхідна для розуміння і формування теорії динамічних здібностей. Однак створення такої узагальної версії, обумовленої впливом випадкових обставин, обмежує передбачення результатів застосування динамічних здібностей і тим самим обмежує практичне застосування концепції.

Оригінальність і цінність дослідження. Зіставлено і проаналізовано взаємодоповнюючі і протилежні погляди на характеристики, причинно-наслідковий зв'язок і обставини конструкту динамічних здібностей.

Обмеження дослідження/Перспективи подальших досліджень. У даній статті позначено напрямки для подальших досліджень як шлях протиставлення, а не злиття різних теоретичних підходів.

Тип статті – теоретична.

Ключові слова: динамічні здібності; теорія; систематичний аналіз літератури.

Динамические способности: систематический анализ литературы по теории и практике

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Цель исследования. Не смотря на то, что концепция динамических способностей – одна из самых исследуемых тем в области стратегического менеджмента, не существует единого понимания её теории. Концепцию также трудно применять практически. Поэтому авторы приняли решение провести анализ существующей литературы по динамическим способностям.

Метод исследования – систематический анализ литературы.

Результаты. Было выявлено множество предстоящих к разрешению разногласий касательно природы динамических способностей и их влияния на успешность фирмы.

Теоретическая значимость исследования. С целью более точных предсказаний рекомендуется использовать различные концепции динамических способностей. При этом необходимо уменьшать количество случайных обстоятельств и стремиться к увеличению их своевременного определения. Рекомендовано прорабатывать различные сценарии, которые должны быть основаны на научных статьях по динамическим способностям, особенно базирующихся на эмпирических исследованиях и подкрепленных практическими примерами.

Практическая значимость исследования. Был сделан вывод, что существует обобщенная версия концепции динамических способностей, которая необходима для понимания и формирования теории динамических способностей. Однако создание такой обобщенной версии, обусловленной влиянием случайных обстоятельств, ограничивает предсказание результатов применения динамических способностей и тем самым ограничивает практическое применение концепции.

Оригинальность и ценность исследования. Сопоставлены и проанализированы взаимодополняющие и противоположные взгляды на характеристики, причинно-следственную связь и обстоятельства конструкта динамических способностей.

Ограничения исследование/Перспективы дальнейших исследований. В данной статье обозначены направления для будущих исследований как путь противопоставления, а не слияния различных теоретических подходов.

Тип статьи – теоретическая.

Ключевые слова: динамические способности; теория; систематический анализ литературы.

Introduction

In recent years, the dynamic capability (DC) concept attracted increasing attention. With more than 200 publications each year since 2011, the DC construct has turned into one of the most researched and discussed topics in the field of strategic management (Easterby-Smith, Lyles, & Peteraf, 2009; Di Stefano, Peteraf, & Verona, 2010, 2014). Nevertheless, the DC construct has not yet been commonly defined: Approaches to DC theory are often disconnected and sometimes contradictory and thus threaten practical implications of the concept (Easterby-Smith et al., 2009; Barreto, 2010; Di Stefano et al., 2010, 2014; Peteraf, Di Stefano, & Verona, 2013). For instance, to date there has been little agreement on the characteristics of DCs and their actual impact on firm performance (Barreto, 2010). Consequently, the very purpose of the DC concept's existence, creating and sustaining competitive advantages in highly dynamic environments, is controversial (Burisch, & Wohlgemuth, 2016).

Research Questions

This paper takes a step back to systematically review DC literature (Tranfield et al., 2003) and evaluate the 'soundness' and 'practicality' of DC theory based on Dubin's (1976, 1978) four elements of theoretical systems. Specifically, this paper seeks to answer the research questions whether existing theories on DCs allow us to understand the theoretical construct and to predict its practical implications.

Method and Data

A comprehensive systematic review on the DCs literature is conducted incorporating articles published over a 26-year time period in multiple renowned management and business journals. The following quality/selection criteria have been applied to the initial 4691 results recorded in the Web of Science database: "dynamic capabilities" being included in title and keywords, the document needs to be a research article (and not a review) and classified as "Business and Management" in the Web of Science, and a citation count above the average of all articles above the average h-index. In addition this procedure was repeated for articles that were published after 2011 (the last review) to include recent developments, since recently published articles have a significantly lower h-index. Three more articles that provided a significant contribution, but are considered as reviews are added: Teece et al. (1997), Teece (2007) and Helfat & Peteraf (2003). The final sample of this systematic literature review are 20 articles (see Table 1).

The journal articles have been analyzed in respect of the four main elements of theoretical constructs by Dubin (1976, 1978). The following sections elaborate (1) the elements of DC theory, (2) causalities within the DC concept as well as (3) contingencies and boundary conditions within the DC framework respectively.

Table 1

Key academic papers on dynamic capabilities

Ambrosini & Bowman (2009)	Rindova & Kotha (2001)
Augier & Teece (2009)	Teece (2007)
Cepeda & Vera (2007)	Teece (2014)
Easterby-Smith & Prieto (2008)	Teece et al. (1997)
Easterby-Smith et al. (2009)	Verona & Ravasi (2003)
Eisenhardt & Martin (2000)	Weerawardena et al. (2007)
Helfat & Peteraf (2003)	Wheeler (2002)
Hodgkinson & Healey (2011)	Winter (2003)
King & Tucci (2002)	Zollo & Winter (2002)
Pavlou & El Sawy (2011)	Zott (2003)

Results of the Systematic Review

Elements of Dynamic Capability Theory

The following paragraphs elaborate (1) the most common underlying components of DCs, processes and routines, (2) the difference between zero-level and higher-order capabilities, and (3) a number of DC frameworks that amplify the units of theory as tangible process combinations.

Processes & routines: Although most authors have been defining DCs slightly different over that last 26 years, there is a somehow common ground on what the underlying components of DCs are: organizational processes and routines. Teece et al. (1997) describe DCs as "[...] organizational processes, that are [...] shaped by firm's assets (positions) and its evolutionary path" (1997, p. 524). Eisenhardt, & Martin (2000) transform DCs into a much more tangible concept by describing DCs as "specific organizational and strategic routines" (2000, p. 1107). Most articles published after the year 2000 adapt and/or partially modify Teece, et al. (1997) and/or Eisenhardt & Martin's (2000) findings (Peteraf, et al., 2013). For instance, Rindova & Kotha (2001), Cepeda & Vera (2007) and Easterby-Smith & Prieto (2008) state that DCs are routines or processes routed in knowledge and evolved through learning processes. Winter (2003), Pavlou, & El Sawy (2011) and Schilke

(2013) agree that DCs consist of highly patterned, to some extent repetitious, routines.

Lower- and higher-order organizational processes: Many scholars distinguish between zero-level and higher-order capabilities. According to Zollo, & Winter (2002, p. 340), first-order capabilities are learned, stable, structured patterns of collective activity and "constitute the firms systematic methods for modifying operating routines", whereas second-order capabilities are the learning mechanisms that first-order DCs are made of/developed from. Winter (2003) refers to zero-level/ordinary ('how we make a living now') and higher-order ('how you change your operational routines') capabilities. The latter are DCs that build or modify zero-level/ordinary capabilities (Winter, 2003, p. 991). Winter (2003, p.992) stresses that although DCs are concerned with change, they are still based on highly patterned routines. Winter (2003) thus disagrees with Eisenhardt, & Martin (2000), who state that DCs consist of simple, experimental routines in fast-paced, high-velocity environments. Wheeler (2002) also describes DCs as a combination of lower-order, simpler capabilities and their underlying routines.

Dynamic Capability Frameworks: Most authors agree that DCs comprise a bundle of processes/routines/ordinary capabilities. Based on this assumption a number of authors developed frameworks that substantiate those underlying components. Teece, et al. (1997) claim that there are three kinds of processes

that form DCs: coordination/integration, learning and reconfiguration/transformation. Teece, et al. (1997) view on DCs shaped many other researchers' publications (e.g. Rindova, & Kotha, 2001; Verona & Ravasi, 2003; Hodgkinson, & Healey, 2011; Schilke, 2013). Teece (2007) expands the concept by claiming that "[...] dynamic capabilities can be disaggregated into the capacity (1) to sense and shape opportunities and threats, (2) to seize opportunities, and (3) to maintain competitiveness through enhancing, combining, protecting, and, when necessary, reconfiguring the business enterprise's intangible and tangible assets" (2007, p. 1319). Authors writing about DCs have often adopted one of Teece's frameworks (e.g. Easterby-Smith & Prieto, 2008; Ambrosini & Bowman, 2009; Helfat & Peteraf, 2009; Hodgkinson & Healey, 2011; V. P. Rindova & Kotha, 2001; Verona & Ravasi, 2003 etc. Wheeler, 2002).

Causalities within the Dynamic Capability Concept

The most significant causality associated with DCs is the promotion of competitive advantage. However, researchers have clashing opinions on how and why DCs affect performance (Barreto, 2010, p. 274). In earlier publications, authors assume a direct relationship between DCs and sustainable competitive advantage, whereas in more recent papers, researchers dispute that DCs have a direct effect on performance. They claim that DCs have an indirect impact on competitive advantage (e.g. Rindova & Kotha, 2001; Zott, 2003; Blyler & Coff, 2003; Weerawardena, Mort, Liesch, & Knight, 2007; Ambrosini & Bowman, 2009; Schilke, 2013). On the very basis, there are three different views on how DCs indirectly impact performance. A range of authors believe that DCs can, under certain circumstances, indirectly, but ultimately lead to sustainable competitive advantage (e.g. Wheeler, 2002; Blyler, & Coff, 2003; Zott, 2003). Other researchers argue that DCs can indirectly cause temporary competitive advantage only (e.g. Eisenhardt, & Martin, 2000; Violina P. Rindova, & Kotha, 2001; Schilke, 2013). Further, a few authors believe that DCs and their direct impact on a firm's resource base simply boost efficiency, but do not necessarily lead to any sort of competitive edge (e.g. Easterby-Smith & Prieto, 2008; Pavlou & El Sawy, 2011; Weerawardena et al., 2007).

Contingencies and Boundary Conditions in Dynamic Capability Theory

A number of authors explain the uncertainty surrounding the DC concept and its effects on firm performance by referring to boundary conditions.

External Contingency Factors: Two of the most common mentioned external contingency factors are *market dynamism* and *competitive landscape* that can impact DC development, deployment and performance (Ambrosini & Bowman, 2009; Pavlou & El Sawy, 2011; Winter, 2003 etc.). However, researchers utter opposing views on how environmental dynamism affects or restricts DCs' impact on performance: Teece et al. (1997, p. 509) explain that DCs are developed and deployed "in environments of rapid technological change". Numerous authors simply emphasize that DC efficiency increases with market dynamism (Rindova, & Kotha, 2001; Wheeler, 2002; Zollo, & Winter, 2002; Sher, & Lee, 2004; etc.). Other authors state that DCs can be effectively deployed in all kinds of market dynamisms. For instance, Zott (2003) elaborates that DCs exist and are effective in fast-paced and slower-paced environments. Also, Pavlou, & El Sawy (2011, p. 261) emphasize a "positive role of dynamic capabilities in the entire spectrum of environmental turbulence".

Internal Contingency Factors: The most common internal contingency factors discussed in this literature sample are (1) *organizational paths and positions*, (2) *learning investments and abilities* as well as (3) *top-/management characteristics*. First, a firm's *positions* (e.g. resource base) and a firm's *path* of

competence development are categorized as essential factors impacting DC creation and usage (Teece et al., 1997; Wheeler, 2002; Easterby-Smith, & Prieto, 2008; Ambrosini, & Bowman, 2009; Pavlou & El Sawy, 2011). Teece et al. (1997) state that firms are position- as well as path-dependent, and that both dependencies affect DC development and deployment. This concept explains why Teece (1997), contrary to Eisenhardt, & Martin (2000), argues that DCs are not simply best practices. Numerous authors agree that DC performance varies with a firm's existing and historical resource conditions (Wheeler, 2002; Easterby-Smith & Prieto, 2008; Ambrosini & Bowman, 2009; Pavlou & El Sawy, 2011).

Second, *Learning investments and knowledge management* are commonly identified as influential contingency factors within the DC concept (e.g. Easterby-Smith & Prieto, 2008; Eisenhardt & Martin, 2000; Zollo & Winter, 2002; Zott, 2003; Sher & Lee, 2004). Third, *management characteristics*, i.e. the experience, skills, mindset and intuition of a firm's top-/management, have been classified influential internal contingency factors (e.g. King, & Tucci, 2002; Wheeler, 2002; Cepeda, & Vera, 2007; Hodgkinson, & Healey, 2011).

Discussion

The DC concept is criticized for lacking theoretical soundness and practical application and implications for its domain (Barreto, 2010). Having analyzed DC literature according to Dubin's theory elements, it can be said that even though the DC concept has been one of the most researched topics in strategic management over the last few years, large parts of its theoretical structure are not yet clearly, and, most importantly, not uniformly defined (Barreto, 2010). Although many differing views on DC theory elements are somehow complementary and can be combined, there are also contradictions. Often these contradictions are routed in the opposing approach to DC theory of the two basic seminal papers: Teece et al. (1997) and Eisenhardt, & Martin (2000), although scholars try to merge both views into one coherent theory using a contingency-based approach (Peteraf et al., 2013; Di Stefano et al., 2014).

Understanding the Dynamic Capability Framework

Units of Theory: Firstly, a firm's resource base and 'firm performance' can be identified as theory units of the DC construct, since DCs reconfigure a firm's resource bundles and indirectly impact firm performance. More importantly, DC literature commonly agrees that DCs consist of various underlying components. Combining the variety of perspectives on what these are, one could summarize that DCs comprise organizational processes, routines and/or bundles of lower-order capabilities (Teece, et al., 1997; Eisenhardt, & Martin, 2000; Zollo, & Winter, 2002). However, researchers' views on the nature of those processes and/or routines are neither consonant nor complimentary/combinable. Certainly, this paper is not the first to identify this divide concerning the nature of theory units of the DC concept (e.g. Easterby-Smith, et al., 2009; Barreto, 2010; Peteraf, et al., 2013; Di Stefano, et al., 2010, 2014; Wohlgemuth, & Wenzel, 2016 etc.). The DC literature allows one to understand the basic DC theory 'skeleton'. However, it should be noted that this generalized version of DC theory units and their characteristics is highly context dependent. This context dependency is an important fact to consider when analyzing the practicality of a theoretical contribution, since all further theory elements are somehow dependent on the basic units of theory (Dubin, 1976, 1978).

Laws of relationships: DC literature seems in unison with respect to the primary causalities of the DC construct, commonly emphasizing that DCs' modify a firm's resource base, including its ordinary capabilities, in order to match or create market change (Pavlou, & El Sawy, 2011). However, there is a theoretical divide concerning the secondary causalities associated with the DC

concept: Theories about DCs' secondary impact on firm performance range from no impact (failure), over efficiency boosting effects, to temporary or even sustained competitive advantage creation (Ambrosini, & Bowman, 2009). These discrepancies can be overcome applying the contingency-based approach used to generalize the understanding of the basic units of theory (Peteraf, et al., 2013). Currently, outcome predictions of DC deployment are largely imprecise. It should be noted that once a theory is uniformly described and explained it is generally understood, however its outcomes can only be predicted if contingency factors and boundary conditions are known and applied (Whetten, 1989).

Contingency factors and boundary conditions: All in all, DC literature allows one to understand that numerous internalities and externalities impact DC development, deployment and effectiveness. However, the extent and kind of impact is often unclear. Numerous attempts to compromise, merge or 'de-paradoxify' contrasting views on the impact of market dynamism on the DC concept offer a rough overview, however cannot provide detailed explanations on how DC outcomes are specifically affected. 'Tangled', almost tautological contingency factors underlying the generalized, contingency-based version of DC theory compromise detailed DC outcomes prediction: For instance, the impact of contingency factors on DC theory units and causalities depends on the nature of DCs, which is again dependent on those contingency factors.

Predicting Dynamic Capability Outcomes

While harmonization/generalization enhances understanding and simplifies the evolvement of the field, it can also compromise one's ability to predict practical outcomes (Thompson, 1967). Since the harmonized version of DC theory, which is rooted in a contingency-based approach and hence highly context dependent, precise DC outcome/effect prediction is next to impossible. Contrasting as opposed to generalizing is expected to simplify outcome prediction by reducing the number of contingency factors, while increasing the predictability of the remaining contingency factors' impact on theory outcomes. After having harmonized the concept and thus understood DC theory and allowing it to evolve further, contrasting might be the next step to ensure that DC theory outcomes can be predicted and thus allow for DC theory's practical application. Contrasting DC scenarios can be facilitated by focusing on a range of specific, empirically researched DC cases. The creation of a small 'database' of specific DC concept scenarios, which are singular in their definition of theory units and causalities instead of context-dependent, might increase the theory's practical application in management today. Various researchers have already examined and/or empirically tested specific DC cases. The DC perspective of accelerated internationalization in born global firms by Weerawardena, et al. (2007) is a fitting example of how specific DC concept scenarios could be realized.

Conclusions and Recommendations

While a variety of papers have addressed analyzing and bridging the theoretical divide in DC theory, this paper uncovered to which extent DC literature allows practitioners to understand each DC theory element and predict the outcome of their interplay. Thus, this paper analyzed the 'soundness' and 'practicality' of DC theory in accordance with Dubin's model of theoretical systems. The qualitative data synthesis exposed that, although DC theory is a strongly researched concept, neither of the four theory elements (units of theory, laws of relationship, contingency factors or boundary conditions) has been clearly and uniformly defined. The theoretical discrepancies might be rooted in the contradictory conceptualizations of DCs in the two seminal papers of the concept, Teece, et al. (1997) and Eisenhardt, & Martin (2000), which have influenced and thus split the entire field.

Since various papers have attempted to merge, combine or 'de-paradoxify' contradictory statements and approaches in DC literature, this paper has applied their contingency-based solutions to justify that DC literature can be commonly understood. However, contingency-based generalization can compromise precise theory outcome prediction. In addition to the contingency-based generalization of DC theory, which enhances the understanding of the construct as a whole, it is suggested to contrast contradictions in DC theory in order to simplify DC outcome prediction. By creating a variety of specific DC scenarios, each being singular in their definition of theory units and causalities instead of context-dependent, the amount of the contingency factors deviating theory outcomes for each DC scenario can be reduced and the impact of the remaining contingency factors can be evaluated. Accordingly, this paper recommends the development of a 'database' of contrasting DC scenarios with each scenario being developed based on the various seminal papers, grounded in empirical research and supported by specific examples. A collection of specific DC scenarios, as a reference point for managers, is expected to simplify prediction and thus foster justification for and practical application of the theoretical concept.

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